



When star wheel (1) senses hole in paper tape (2), arm (3) is rocked counter-clockwise under the urging of contact wires (4) which limit on lower surface of contact screw (5). Electrical circuit is thus completed from common lug (6) to lug (7). Longer wire (8) urges arm (3) against mechanical limit (not shown) to reduce bounce. Drive shaft (9) extends rearward through panel (not shown) and carries bi-directional ratchet (10). Energization of coil (11) attracts armature (12) and engages pawl blade (13) under next tooth. Pawl depressor (14) disengages opposing pawl blade (15). Tip (16) of armature moves card (17) to open interrupter switch contacts (18). Upon de-energization of coil (11), pawl blade (13) steps shaft (9) under urging of spring (19). Interrupter switch recloses near end of armature return. Pulsing of other coil (20) steps tape in reverse direction.

METHOD OF READING

Sensing of the punched holes is accomplished by the use of star wheels. When a star wheel enters a hole, an arm carrying the star wheel closes a switch. The switch construction is similar to the switches in wire relays. Bounce time of the sensing switches is well under a millisecond. A switch is also provided on the tape hold-down arm. When tape is being loaded into the unit this switch is open.

A unique advantage of star wheel sensing over all other methods of hole sensing is that the sensing switch remains closed when a series of holes is sensed. Only when a no-hole is sensed is the star wheel arm raised and the sensing switch opened. Thus, only a single tape channel is required to control the pull-in and drop-out of a relay.

If interruption is desired, the sensing switch common may be wired in series with the interrupter switch.

TAPE FEED SYSTEM

A unique dual cross-coupled pawl system is employed for stepping of the tape in either direction. The stepping of the tape occurs on the spring return stroke of the electromagnet. An interrupter switch is provided with each electromagnet. The interrupter switch is actuated by an extension of the electromagnet armature. When the armature pulls in, and at the point when the pawl locates in under the next tooth on the ratchet, the interrupter switch contact is opened. Due to a built-in delay, the interrupter switch remains open until the electromagnet is fully de-energized and has advanced the tape. The function of the interrupter switch is two-fold. It provides a means for continuous self-stepping of the tape when the circuit to the magnet coil is in series with the interrupter switch. Also, the interrupter switch can protect the make and break of the star wheel sensing contact.

ELECTROMAGNET PULL-IN TIME

An adjustable resistor is provided in series with each coil and is adjusted at the factory for an armature pull-in time of 18 milliseconds. It may be adjusted for other values. The pull-in time of the electromagnet is a function of the input

power. The following table lists several wattages and their corresponding pull-in times:

POWER (wattage)	MILLISECONDS
22	22
24	19
26	17.5
28	16.3
30	15.5
35	14

ELECTROMAGNET DROP-OUT TIME

The electromagnet coils are arc suppressed with a diode across the coil. With this suppression circuit the drop-out time is approximately 12 milliseconds.

AVAILABLE VOLTAGES

The Reader is available for input voltages of 24, 48 and 90 V.D.C. Coils are conservatively designed for continuous duty.

CONTACT RATINGS

The interrupter switch contact rating is 3 amps. The star wheel sensing switch contact rating is 3 amps., steady state. For switching, star wheel contact life is a function of contact current.

The table below lists several current ratings for switching resistive loads and their corresponding life expectancy.

CURRENT (amps)	LIFE (no. of switching operations)
.035	200,000,000
.100	100,000,000
.500	20,000,000
1.000	5,000,000

LIFE OF UNIT

The Model 119 Tape Reader has passed 100,000,000 cycles in our life test program with no discernible wear noted.

DIMENSIONS OF UNIT

The Reader is 3½" high and 12¾" wide, and is available with extension plates for mounting on a standard 19" rack. Depth behind panel is 3½".

WARRANTY — OHR-TRONICS, INC. warrants the Model 119 Paper Tape Reader to be free from defects in material and workmanship, including mechanical wear of parts, and to perform in accordance with applicable specifications for a period of **one year from date of delivery!**

OHR-TRONICS, INC. will provide free factory service, including parts and labor for any malfunction appearing as a failure to perform in accordance with applicable specifications during the one year period.

This warranty is void if this production is subjected to misuse, neglect, accident or improper installation or application.

Obligation under this warranty is limited to servicing or adjusting the Model 119 Paper Tape Reader or parts thereof, which upon authorization from the Company, are returned to the factory, transportation charges prepaid.

OHR-TRONICS, INC.

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PLANT

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MODEL 119 PAPER TAPE READER

The Model 119 Paper Tape Reader reads up to 8 channel paper tape, bi-directionally, at a speed of 30 c.p.s. Tape readers for more than 8 channels are available on special order.

Price: \$350.00

TAPE READER with COMMUTATOR

The Model 119C Paper Tape Reader is similar to Model 119, with the addition of a 12 point commutator on the sprocket shaft. The Model 119C Paper Tape Reader (with the addition of some relay circuitry) may thus be used in place of block readers where more than 8 channels of data are needed.

Price: \$445.00

TAPE READER with REELS

The Model 119R Paper Tape Reader is similar to Model 119, with the addition of mechanism for bi-directional unwinding and take-up of tape onto plastic separable reels.

SERIAL ENCODING KEYBOARD

The Model 117 Encoding Keyboard will be available in the summer of 1964. Eighteen keys are provided. All keys are interlocked to prevent depression of more than one key at a time. A new key entry can not be made without an answer-back from the receiving equipment for the previous key entry. Output of each key depression is an eight-level code on eight switches. A separate switch for each key is also available. A power-assist electromagnet is used to reduce the force required for key depressions.

For more detailed information and name of Local Representative call collect (area 201) 489-8080, Sales Department, So. Hackensack, N. J.

OHR-TRONICS, INC.